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**KNOWLEDGE SHARING BARRIERS
AT ADMINISTRATIVE LEVEL
OF UNDERGRADUATE PROGRAMS**

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Abstract: It is widely recognized that knowledge is the critical asset to individual as well as organization to succeed in the increasingly competitive environment. The study of knowledge sharing is dominated by those focusing on knowledge sharing activity within the business organizations. However, the issue of knowledge sharing is equally important for a knowledge-based institution, such as a university, where knowledge production, distribution and application are ingrained in the institution. Though there is no direct way to measure the outcome of knowledge sharing in knowledge institutions, the impact of knowledge sharing could be larger than those created by the business organizations.

In this paper we explore the knowledge sharing barriers in the administrative processes of the undergraduate educational programs on an evidence of the Bachelor in Management program at one Business school. The study employs qualitative method, based on semi-structured in-depth interviews with the administrative personnel involved in the program's management. On the basis of the interview results, recommendations regarding improving the program's knowledge sharing environment are given, as well as the methodology of further quantitative research is developed, planning to expand the research to a statistically significant sample of educational programs at University as well as other educational institutions.

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Introduction

Codification issue

In this work we are observing the problem of knowledge sharing at the level of one Business school in Russia. To the extent of ethical and professional conditions we do not name this Business school as well as the University it is from. The key point of this working paper is to shed light on the problem of knowledge sharing and knowledge sharing barriers that occur during communication. This problem is typical for educational institutions of any kind and the main interest lies in solving this challenge and not pointing out the particular name. We use definitions “Business school” to describe the particular faculty and “University” to describe the particular university.

Actuality

The ongoing advance of technology has influenced in people’s actions and activities to become more complicated with likelihood of appearance of the new problematic situations. The educational sphere as well as precisely the sphere of high schools is not an exception.

Improving process management becomes a key objective of many companies. Low level of strategy success is primarily due to the fact that information maintenance and analytical support did not pass into the category of more or less proven technologies (Latunin & Bokova, 2003).

The problem of information support is getting into two science spheres and these are Knowledge Management (KM) and Business Process Management (BPM). KM allows companies and institutions to manage and exchange knowledge from the place where it is originally generated to where it is to be exploited. KM assists the needs of internal (in our case, the faculty, teachers, administrative staff, etc.) and external customers (in this case, students) by generation of organizational routines that facilitate creativity of individuals and effective processes (Marulanda & Montoya, 2015).

Papers regarding the issues of business processes and educational context tend to differ in the ways they are trying to look at the problem in order to solve it. Some (Gjoni, 2015) use the approach to develop information systems and implement a model-oriented approach since it focusses on the business logic (the “what”) rather than on the specific implementation technology (the “how”) (Lacerda et al. 2014).

BPM is not only about designing, developing and executing business processes, it also considers the interaction between these processes, managing, analyzing and optimizing them (Kohlbacher, 2010; Saraswat et al. 2014). Changing the approach to operational management of the company to a process oriented management approach involves defining the responsibilities for the conduct of the proceedings (Ahmad et al. 2007; Palmberg, 2010), minimize transfers, thereby reducing errors and time delays, maximize the grouping of activities and reduce the effort (Antonucci & Goeke, 2011; Paim et al. 2008).

Organizational design of business processes is a leadership competency and responsibility that is taking on even greater importance as organizations require agility to respond to the environment (Ritacco, 2015). Human resources with developed talents and creativity who are able to reach and utilize information constitute the main power of competition in the world market (Kleinhempel et al. 2010; Cabanillas, 2016). Those companies and institutions that make investments on human resources and attempt to create working conditions that are compatible with their requirements and wishes, are the ones who reach success (Burma, 2014).

These changes are of top importance if institution desires to remain competitive. As means of support companies can employ various approaches, techniques, tools and models; these, however, are not always adapted to the needs (Vedenick & Leber, 2015). In our case

we have identified them before constructing the scheme of business processes and their implementation.

Business processes in the context of the current available information technologies (IT) leads business education towards sustainable development and highlights its ability to offer a missing link between business, IT and strategy (Seethamraju, 2012). According McCormack et al. (2009), advancing in the management of business processes, the organization will have better control of results, better prediction of goals, cost and performance.

There are permanent requirements for the changes in performances, increasing flexibility and improving the economic position of the company or other institution through the process orientation (Milan et al. 2014). As processes are aimed to the same goal, unnecessary and misdirected steps are redesigned or eliminated, concentrating resources on core processes and improving the organization's performance (Segatto et al. 2013) and the systemic approach may be a key subject to clarify the inter-relationships among processes (Basal, 2010), and processes and their contexts. In this paper we have considered different approaches towards constructing the administrative and academic business processes.

Some research specify on the focused problems of curriculum upgrades in one educational program (Hauck, 1998) but in our paper we describe the case of dealing with 18 business processes regarding undergraduate program from two different perspectives.

Other research findings upon the curriculum design (Lin, 2015) present partially positive effects on fluency, flexibility, originality, and elaboration and reveal significant moderating effects on the correlations between curriculum design and creative potential developing (Vazzana et al. 2000). Effective business process management inside the institution in its turn allows to enhance the overall quality of the knowledge management policies (Cao, et al. 2013).

The managerial problem in Business school that we analyze is typical for all educational institutions. Due to the changes in the organizational structure on the level of University, insufficient staff and changes in the undergraduate programs Directorate, the integrity of the information had been flawed and that ultimately led to the need of developing a model of information support. This paper will describe how information support was maintained inside Business school regarding the management of the undergraduate programs.

The remainder of this paper is structured in the following way: we analyze the circumstances that led to the emergence of the problem, develop the framework to work with the problem, provide the example of the particular case and summarize main outputs in the conclusion part.

Main Body

Topicality and theoretical background

A common view on educational organizations, especially classical universities with a significant academic component of activity, is that these are environments with culture highly tolerant to - and even encouraging - knowledge sharing leading to creation of new knowledge (Fullwood, Rawley, Dambridge, 2013).

However, although it is undoubtedly true for the culture of relationships between the professors and students, the situation for the educational organizations' administrative departments is often strikingly different, with a considerable research evidence of existing barriers to information and knowledge sharing of different nature (Beeson, Green, Kamm, 2009; Zhukova, Pleshkova, Mihnevich, Pehtin, 2016).

In accordance with the division of theoretical and practical approaches to knowledge management to information technology based (IT), organizational management based (OM) and organizational economics based (OE), presented in (Katkalo, 2011), the barriers to information and knowledge sharing figured out by different authors can be classified into three consequent groups.

From these three groups of barriers, the OM type can be called the most important and even primary one, as the problems of organizational structure and related organizational aspects can lead both to problems in information technological sphere and to the problems of important knowledge holders perceiving their knowledge resources as a source of power within the organizational relationships (that is the typical OE-type barrier, motivating the knowledge holders toward reluctance to knowledge sharing).

As the main organizational management based barrier to knowledge sharing in universities, according to literature, such thing can be named as excessive complexity of the universities' organizational structure, often causing duplication of functions between different subdivisions and, thus, insufficient understanding of the official duties of different personnel (Beeson, Green, Kamm, 2009).

Insufficient transparency of the organizational structure and existence of the functions duplication leads also to significant organizational economics based barriers, described in such works as, e.g., (Bratianu, Orzea, 2012; Knudsen, 2007).

According to (Katkalo, 2011), the organizational economics based aspect of knowledge management is based on a fact that knowledge (as well as data and information) is an economical resource and a source of economic rents generation for the organization as a whole as well as for different subdivisions of the organization and even for specific employees owning these knowledge, information or data. Indeed, if the ownership of rare, valuable, inimitable and non-substitutable resource can be a source of economic rent generation for an organization (Barney, 1991), than for the specific employees of this organization ownership of resources with such attributes (and there is no doubt that the knowledge resources, related either to professional expertise area or to the political situation within the organization, can have these attributes) can be a reason for intraorganizational rent-seeking behavior. The subsequences of such behavior could be related, firstly, to rising of a particular employee's position in the organization's informal organizational hierarchy, that is not always working in synergy with the formal hierarchy (Goduscheit, Knudsen, 2015), and secondly, to constrain the transfer of rent-generating data, information and knowledge to an extent that can damage the functioning of the organization as such (Knudsen, 2007).

Finally, the same organizational problems of overcomplicated organizational structure and ambiguous job duties can lead to information technology related barriers to knowledge sharing: as one of the most prominent barriers of such type, insufficient level of informational environment in the universities can be named, e.g., presence of mutually incompatible IT systems in organizational subdivisions, working for the same educational programs (Blagov, Bogolyubov, 2012).

Empirical research object and methodology

An object of empirical research of the knowledge sharing barriers of the educational program administration is such program as the basic educational program of Bachelor in Management of Saint Petersburg State University.

Aside for being a convenience sample object due to the authors' affiliation to the Graduate School of Management of Saint Petersburg State University, that is an university's subdivision on which this educational program is realized, this program is an interesting object for research due to other reasons.

The Bachelor educational program for the last several years has become an object of a number of administrative reforms both on the University as a whole and the program in particular levels (e.g., shift from the department management to the program management principle in the University), thus dramatically increasing the organizational ambiguity and the document overload (Zhukova, Pleshkova, Mihnevich, Pehtin, 2016).

The methodology of the study is qualitative, based on semi-structured in-depth interviews with the administrative personnel involved in the program's management. On the basis of the results of the study, several recommendations regarding improving the program's knowledge sharing environment (both in organizational and technological ways) are given, as well as the methodology of further quantitative stage of research is being developed, planning to expand the research to a statistically significant sample of educational programs at University as well as other universities.

On the quantitative stage of research, presented in this paper, 10 interviews have been held, with a participation of personnel from such administrative subdivisions as the Bachelor program directorate, program office, international office, extra-curriculum youth affairs office. The respondents have been chosen to fulfill the following conditions:

- A) different position in formal administrative hierarchy;
- B) different territorial location;
- C) different job experience;
- D) different job tasks.

Each of the interviews have been lasting, on the average, from 20 to 50 minutes, and was based on the following open questions:

- Describe please the usual process of information and knowledge exchange you are engaged in. What information and knowledge are you typically exchanging and with whom?
- How does this exchange interaction take place technically: is it mainly based on oral communication, or happens via e-mail, or other specific IT infrastructure, or anyhow else?
- Try to compare the situations in which the information or knowledge is shared by you on request of your colleagues (from your or any other subdivision) and in which your colleagues are sharing information or knowledge on your request? Do these situations differ, and if yes, how do they?
- Are these differences influenced (and how, if they are) by the comparative position of the interacting employees in formal organizational hierarchy (i.e., information or knowledge are shared between the equals or between the boss and the subordinate)?
- Is the information or knowledge transferred in each of these cases in full and on time?
- How do you think, what factors are hampering (in each of these cases) the transfer of necessary information or knowledge in full and on time?
- What measures are necessary to undertake (in the organizational structure of the educational program management, in the employees motivation system, in the IT infrastructure of your or related subdivisions) to decrease the influence of these hampering factors?

Results and discussion

The answers of the 10 questioned employees allowed to figure out a number of repeating suggestions reported to the interviewer by all the respondents.

The first thing called by nearly all the respondents to be a cause of barriers to knowledge sharing is the fuzzy hierarchy in the University, caused by continuous administrative reform turmoil and by existence of the so-called “virtual positions” not included into the staff schedule.

These factors lead to several problems (see more in Appendix 1):

1. Lack of motivation to share information or knowledge as an activity not included into the official job duties;
2. Lack of understanding what employee has what information or knowledge;
3. Increase of time of getting necessary information or knowledge due to necessity to contact its holder via her/his subdivision head;
4. Conflicts on the basis of incorrect formulation or requests for necessary information or knowledge.

The other problems named by the respondents to be significant knowledge sharing barriers are related to the peculiarities of the IT infrastructure of the educational program systems management.

The main problem of the IT infrastructure is told to be low compatibility of different informational systems used by different subdivisions, and, moreover, low compatibility of the electronic document management system “DELO” used by all the subdivisions, with the systems used by each of them; several respondents have repeated that the low level of this system’s integration potential, as well as the limitation of the users’ rights, restrain the usage of this system only to the level of sending the documents to be signed, that is a rather small part of the system’s functionality.

So, in general, it can be said that the IT infrastructure supporting the management of the Bachelor program needs increase in integration between different subsystems (firstly and foremostly, the DELO electronic document management system and the file server, with widened access to these systems by all the employees); in addition to that, a possibility of simultaneous document edition by different users is needed.

As for the organizational factors influencing the knowledge sharing barriers, better formalization of job tasks for different positions seems to be needed, to minimize the effects of job task ambiguity and depressed motivation to information and knowledge sharing.

Conclusion

On the basis of 10 semi-structured in-depth interviews with the administrative personnel of different subdivisions engaged into supporting the Bachelor program of the University, several factors are figured out to lay in the foundation of significant barriers to knowledge sharing.

Namely, such factors have been named, as ambiguity of job tasks between different employees, low level of integration between the information systems used by different subdivisions, lack of access to the corporate file server and inability to edit the documents simultaneously within this server.

A suggestion can be made, that the measures undertaken to correct these conditions can increase the intensity, effectiveness and time efficiency of knowledge sharing processes on the Bachelor program at Business School.

In addition to the practical value of the recommendations, on the basis of the results of the qualitative study, a questionnaire for the further quantitative study is being developed, that is going to be used for comparatively studying the knowledge sharing barriers in different universities.

Limitations of the research

There are several limitations of the research that may be defined at this stage and they are:

- Geographic location of the respondents (business processes, knowledge sharing policies and culture in Russia may be different from that in other countries/universities);
- Educational sphere (the scope and the interpretation of the results may be limited to the extent of observed educational institutions);
- Thus the results of the study will be applicable only for the market of universities although there will be some attempts to introduce the flexible model of dealing with knowledge management issues in different markets.

Directions for further research

Considering the further research directions, both directions of theoretical and practical applicability can be formulated.

As for the theoretical ones, firstly and foremostly the quantitative continuation of the qualitative research stage must be named.

Speaking from a methodological perspective, the qualitative research described in this paper can be further developed in two directions: an “extensive” direction of broadening the research scope, and an “intensive” direction of looking on the same research object (or a sample of objects very close to the qualitative stage one) with more elaborate research methods, for example, quantitative ones.

As for the “extensive” direction, its basic subdirections are based on the evident limitations of the research scope of the qualitative stage, which was looking on knowledge sharing processes within only one organization. Thus, it seems obvious that the research scope can be broadened to, firstly, a sample of several different universities or other educational organizations (where the research can be held both in a qualitative and a quantitative way); comparison between knowledge sharing processes in different universities with different organizational structures and cultures can reveal considerably interesting and scientifically novel insights into relationships between organizational structure and culture variables and knowledge sharing barriers in such a specific industry context as higher education.

However, it is also obvious that the research methodology developed in this study surely must not be limited by higher education as an industry context of the research object. Indeed, if we look on the qualitative research questionnaire shown at page 7, we shall see that it is practically lacking any signs of industry specificity (except for the phrase “organizational structure of the educational program management” in the last question, but the mentioning of the “educational program management” can be removed from this phrase without any considerable distortion of meaning). Thus, the questionnaire can be used for researching the knowledge sharing barriers in organizations of various industries and markets; for example, a potentially fruitful direction of research seems to be a comparison of knowledge sharing barriers between administrative personnel in higher education and industrial companies in different spheres, to prove or refute the hypotheses about different knowledge sharing tolerance in these various industry contexts.

In addition to the broadening of the research scope that lies in a foundation of the “extensive” directions of development of the research methodology, such an “intensive” direction can be suggested as a development of a quantitative research methodology and design.

Continuing and developing the logic of formulating the qualitative research questionnaire, the quantitative one also can be based on the idea of three types of barriers to knowledge sharing, related to the informational technology, organizational management and organizational economics aspects of knowledge management.

Factors of these types can be used as a basis of the independent variables of the research, with the characteristics of the knowledge sharing process (e.g., speed of reaction to requests, or fullness or adequacy of shared knowledge resource) as the basis of the dependent variables.

Both the independent and dependent variables can be measured with the help of Likert scales showing the respondents' subjective perception of the knowledge sharing parameters and barriers, because it could be rather hard to find objective numerical indicators for all the variety of IT, OM and OE factors lying in the foundation of the independent variables even in one organization, not to speak about different organizations that could be included into the sample of the quantitative research. Regarding the specific econometric methodologies used for measuring the relationship between the independent and dependent variables, the multiple linear regression modeling seems to be an appropriate instrument, also with possible introduction of more complicated modelling methods for the sake of looking of moderating effects of different independent variables on each other

Considering the research sample of the quantitative research stage, again it can be repeated that the direction of the research sample development could have an "extensive" (here, constructing the sample from a number of different companies of various industries to enable inter-industry comparisons) or "intensive" nature (here, constructing the sample from a number of different universities to enable deeper analysis of the knowledge sharing processes and barriers specific for the higher education industry).

Comparison of organizations with different organizational structure types (both within one or various industry contexts) can also help reveal specific knowledge sharing barriers of IT-, OM- and OE-related types on strategic, tactical and operational levels in different organizational structures, that can link the methodology and results of the study to the realms of research in strategic management and organizational behavior, not to say about possible practical applicability of such barriers classification

In addition to further development of empirical research methodology, the research presented in this paper also has directions of further development related to the possible practical implications of the results of the qualitative stage and of further research stage results

By the level of the object of practical implication, such directions can be divided into three hierarchically organized levels:

- development of practical recommendations for the organization that has been under scrutiny on the initial qualitative research stage (i.e., the Business school);
- development of practical recommendations for the higher education institutions in general;
- development of practical recommendations for organizations from different industry and market contexts.

On the basis of the results of the qualitative stage of the research presented in the "Results and discussion" part of this paper, most sound recommendations can be given for the hierarchically lowest level of the abovementioned classification, i.e., for the described educational programs management.

The most obvious of these recommendations seem probably to be these regarding the information technology related knowledge sharing barriers; however, if the necessity of greater integration between different information systems used by interacting organizational subdivisions could be called a really obvious result that didn't need additional empirical research for grounding, the recommendation of enabling the documents (ideally – in the integrated document management system) to be simultaneously editable by several users does not look as obvious and seem to be a considerably interesting result of the qualitative research. Respectively, one of the "practical" directions of further research development could be a joint project with the Office of Information Technology managers and

programmers oriented on the development and implementation of such a feature into the programs' (or even the whole University's) document management systems.

As for the practical research directions dedicated to overcoming of the organizational management and organizational economics related knowledge sharing barriers, such directions could take form of thorough analysis of the organizational structure of the University as a whole and of its subdivisions engaged into realization of the researched educational programs in particular, searching for actual and potential sources of unnecessary functions duplication or job tasks ambiguity, and thinking out methods for optimizing the respective organizational structure fragments with maximal outcome and minimal costs for the University, as well as minimal time waste and process complications for the program.

Regarding the possible practical implications of the next two hierarchical levels (for the broader samples of organizations), it can be said that surely the results of the Business school Bachelor in Management program administration allow mainly for working out practical recommendations for the respective organizational object, and a generalization of these recommendations for a broader scope of organizations is hardly possible due to the abovementioned high organizational specificity of some results and quasi-obviousness of the others.

However, although the specific recommendations for specific organizations that haven't been yet researched can hardly be given on the actual research stage, the methodological principles that can lie in the foundation of figuring out such recommendations can be named, as these can be supposed to be the same as described above for the practical implications for the Business school.

Namely, the practical, "applied" research directions for other organizations could be based on thorough analysis of the organizational structures and related business processes, with a goal to figure out the potential organizational ambiguities or business process bottlenecks connected to specific knowledge sharing barriers of the IT-, OM- and OE-related types.

Conclusion

Developing the actual streams of research in knowledge management and business process management in educational institutions, the research presented in this working paper is intended to explore the knowledge sharing barriers in the administrative processes of the educational programs management.

The overall design of the study does imply several research stages.

The initial empirical part of the study is a quantitative one, based on semi-structured in-depth interviews with the administrative personnel of one specific educational program (namely, the Bachelor in Management program of the University).

Guided by the interview questions intended to figure out the knowledge sharing barriers related to information technology, organizational management and organizational economics aspects of knowledge management, the respondents described a set of barriers, including the fuzzy organizational hierarchy and related job tasks ambiguity, as well as IT infrastructure problems of low compatibility of document management systems used by different administrative subdivisions and absence of possibility to edit documents simultaneously by several users.

The results of the initial qualitative research stage allow suggesting a number of further research development directions.

Considering the development of the empirical part of the research, aside of the obvious idea of broadening the sample of the qualitative research to a sample of different educational institutions or a sample of organizations from various industries, a quantitative stage of the research can be proposed (again with possibility of holding the research on different respondent samples). The suggested design of the quantitative research can be based on

multiple linear regression analysis of relationship between the indicators of strength of the knowledge sharing barriers of different types as independent variables, and indicators of the characteristics of the knowledge sharing process (e.g., speed of reaction to requests, or fullness or adequacy of shared knowledge resource) as the dependent variables, with possible introduction of more complicated modelling methods to look on moderating effects of different independent variables on each other.

In addition to the theoretical and methodological value, the results of the qualitative research stage presented in this paper also seem to have a considerable practical applicability.

Indeed, the knowledge sharing barriers figured out from the respondents' interviews allow developing concrete practical measures of overtaking these barriers (especially the barriers related to the IT infrastructure of the University that can be overcome by a set of technical measures; as for the organizational management and organizational economics type barriers, the revealed problems show the directions for specific analysis of the organizational structure and business processes to find out job task ambiguities, especially those related to the process bottlenecks). Moreover, in addition to the practical applicability of the quantitative stage results related to the specific organization, the overall research methodology can lie in the foundation of practical measures of knowledge sharing barriers overcoming in different organizations, based on looking on the organizational ambiguities or business process bottlenecks connected to specific knowledge sharing barriers of the information technology, organizational management and organizational economics related types.

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Appendix

Table 1. Keypoints from the interviews

1	Bachelor Directorate	<ul style="list-style-type: none"> • Difficulties regarding meetings organization (possible way out of this problem may be consideration of use of such technological instruments as Skype for regular meetings organization); • Mistakes in mail destination (hard to understand the importance of the letter and who is the email targeted to as people mess the original destination and the copy); • Lack of access to local net for some employees; • Lack of possibility to edit documents in real time – need to resend the documents for consistent editing; • Lack of general clear understanding of employees duties (for example, invited professor, no understanding of subordination hierarchy processes).
2	University Admission Office	<ul style="list-style-type: none"> • Need for frequent use of telephone paired up with artefacts absence and evening tiredness leads to loss of important agreements; • Problems with “DELO” system: poor sorting, loss of documents, absence of mail notifications, edited documents do not delete, non-regulatory work with documents; • Need for use both corporate mail of Business school and University school (some letters are ignored if sent not from the proper email box); • Hierarchy problems (no clear understanding whom to submit, working positions are not secured in the staffing curriculum of University).
3	Bachelor Directorate	<ul style="list-style-type: none"> • Use of “DELO” system leads to the loss of important documents (its use is not profitable); • No access to local net and questions regarding its security; • Absence of electronic signature; • Absence of instruments for conference calls (leads to time loss while finding needed people on big campus); • Absence of employees under direct submission as a cause for slow reaction towards tasks.
4	Youth work management	<ul style="list-style-type: none"> • Problems with sorting documents and documents loss in “DELO” system; • Documents templates are stored in outdated system of Share Point; • Failure to comply tasks with documented timing; • Non-execution of agreements made during telephone calls.
5	Bachelor programs service provision	<ul style="list-style-type: none"> • Partial ignorance of emails by the students; • Absence of access to registered documents in information system.
6	Bachelor Directorate	<ul style="list-style-type: none"> • Problems with organizational structure (submission to University while performance of Business school); • Lack of access to documents editing and downloading from “DELO” system; • Lack of fast communication between different buildings.

7	International educational cooperation department	<ul style="list-style-type: none"> • Impossibility to use system “DELO” for fast reaction at urgent problems and questions; • Absence of 1C system at undergraduate programs (while it is present at master programs); • Seasonality (work overloads during September and May months); • Absence of electronic signature; • Absence of conference calls network.
8	Bachelor programs service provision	<ul style="list-style-type: none"> • Hierarchy of Business school makes the communication process possible between key managers (decreasing the speed of business processes on other levels); • Information systems development without considering potential needs for its employment (lack on functions inside these informational systems, for example, downloading the documents); • Impossibility to edit documents in parallel; • No access to local net.
9	Bachelor Directorate	<ul style="list-style-type: none"> • Frequent changes in business processes system; • Unclear system of staff duties; • Absence of integration and notifications between the systems (local net – mail – “DELO” – 1C); • Lack of possibility to edit documents with different version saving; • Oral and telephone agreements can be forgotten and are not performed.